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ABSTRACT

At Clark State Community College (CSCC), in Ohio, faculty in the Commercial Art and English departments have investigated and debated the best uses for a Mac Lab. Computer needs for the Commercial Art Program were determined through visits to local businesses that produce art on a commercial level; to local secondary school commercial art programs; and to Sinclair Community College, which has one of the most progressive two-year commercial arts programs in the state. Based on these visits and lengthy discussions, changes in the Commercial Art program to replace traditional paper-based methods of design and layout with computer-based methods were recommended. Similarly, English faculty contacted instructors at two- and four-year institutions in the state to determine how computers were used in the English curricula, and reviewed the literature on the value of word processing skills as a tool for composition students. English faculty determined that the use of computers in CSCC English classes should begin with a few classes taught each quarter in the Mac Lab, with almost all full-time faculty interested in teaching a section of English 1 in the lab on a pilot basis. To meet the needs of the two departments, the Mac Lab needs a total of 30 work stations with CD-ROM drives (28 for student use, 1 in the lab for instructor use, and 1 for the commercial art faculty to use for grading and exploration of software); 6 printers (including 2 large format and 2 color printers); and 2 color flatbed scanners. All computers will be loaded with the software for both Commercial Art and English applications. The labs would be used for classes 60% of the time, and open for general student use 40% of the time. A sketch of the proposed lab and a budget are included. (KP)

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ED 376 878

Proposal and Rationale for the Development of a Mac Lab

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

Paper presented at the Annual Conference on Information Technology of the League for Innovation in the Community College. (10th, Houston, TX, November 13-16, 1994)

JC 940 648

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Subject: Proposal and Rationale for the Development of a Mac Lab
Date: 1/7/93

As you know, the faculty in the Arts and Sciences Division have been discussing the development of a Mac Lab for approximately two years now. This proposal represents the collective thought of the faculty in Commercial Art and in English, who have spent many hours debating the best uses for this lab. Bob Walder and Jim Hebner have provided valuable technical expertise.

Background for the Recommendations for Computer Use in the Commercial Art Curriculum

Eunice and Richard have determined the computer needs for the Commercial Art Program in a variety of ways. They have visited several individuals/businesses in our local area whose primary function is the production of art on a commercial level. These include: Bingenheimer Design, Inc., Vie Design, and Sue Hebner. From these visits they have discovered that approximately 35% of all jobs now go to the printer on disk; Mr. Bingenheimer predicts that 90% of all jobs will be done on computer and go to the printer on disk within five years.

Eunice and Richard have also visited or contacted the Clark County JVS and Sinclair Community College to determine ways that our program can dovetail with local secondary programs in commercial art and ways that our program might mirror Sinclair's, one of the most progressive two-year college programs in commercial art in the state. It is clear that Macintosh is the standard in the graphics industry. Eunice hopes that our lab, in particular, will offer advanced training for Clark County JVS students (who already get training on the Mac) and that we can expose our

students to a variety of software packages (which is a goal for students at Sinclair).

Eunice also devoted the last Commercial Art Advisory Committee meeting in November to a discussion of the computer needs of our program. The group unanimously recommended that the college adopt Mac's for our program to help prepare our students for jobs in the graphics/art industry. They also noted that the industry is becoming computerized so rapidly that our students will be ill prepared to enter the art field without a basic exposure to computer use and applications.

Computer Use in Commercial Art Curriculum

Eunice and Richard have spent considerable time discussing how computers should be integrated in the art curriculum. The following describes in detail how specific classes would make use of a Mac lab.

Students will encounter computer use in their first quarter in the Commercial Art Program in CA 105, Advertising Principles and Practices, a course which introduces students to many facets of the art industry. We will schedule a two-hour lecture for this class each week in R 219 and then a two-hour lab each week in the Mac Lab. Students should complete a minimum of one assignment in the lab, mostly with Aldus Pagemaker. Although most of the coursework in the first year will be devoted to the development of "hand-eye" skills in drawing and design (which assumes that the computer is only a tool that will facilitate for students who already possess certain artistic skills), students will also meet for a two hour lab each week in CA 212, Typography, in the spring term, to learn about point size, fonts, and the setting of body copy.

In the second year of the program, the curriculum becomes more strongly integrated with computers. Electronic Publishing, CA 230, and Graphic Arts I, CA 234, both fall term courses, will be offered exclusively in the Mac Lab. CA 230 will remain much as it is now with students moving from simpler to more complex assignments through the use of Pagemaker. CA 234 will teach students to scan images, to call up/merge clip art, and to set type through Pagemaker. Layout I, CA 211, also offered in the fall, will remain a "traditional" art course with a focus on marker use, in that students need a knowledge of the basics before they can advance to more

sophisticated tools.

However, because the art faculty realizes that the traditional methods of producing ideas of designs and layouts through the use of markers, pastels, etc., on paper in rough and comprehensive form are being replaced with computer technology, our second and third courses in Layout (CA 212 and CA 213) will be totally computer based. In these two courses students will gain more exposure to concepts introduced in Electronic Publishing and be introduced to PhotoShop, a software package allowing manipulation of images. In Layout III, in particular, they will learn how to "pull" different images (such as photographs) and combine or alter these images for a different and creative result. In this class 11 by 17 inch paper will be used for color separation and for showing crop marks in the marginal area. The layout courses are offered in the winter and spring terms respectively. In Graphic Arts II, CA 235, offered in the winter, students will further develop skills acquired in CA 234. They will also be preparing for their spring Co-op work experience; it is our expectation that their exposure to computer use in the art field will assist them in acquiring good placements.

In the spring of the second year, students will complete Computer Art, CA 240, exclusively in the Mac lab and will use Aldus Freehand for creating illustrations and designs. They will also enroll in CA 245, Commercial Art Portfolio Development, our capstone course that focuses on the perfecting of work as students prepare to leave Clark State. Students will need ready access to the lab in this class as they revise and prepare work for their portfolios.

<u>Background for Recommendations for Computer Use in the English Curriculum</u>

As you recall, Julia Deems originally laid the groundwork for our use of computers in the English curriculum. Since her departure, the English faculty has conducted further research. They have contacted faculty at Wittenberg, Wright State, Cedarville, and Ohio State to determine how other English departments are integrating computers in their curriculums. In general, they have found that other colleges/universities do not require keyboarding as a pre-req. to computer classes (our faculty is concerned about the typing skills of entering students, in that the faculty do not

have the background or the desire to teach typing), that WordPerfect seems to be the standard on most campuses, and that only certain sections of freshmen composition are offered in an actual computer lab (although several offer computer training of one sort or another).

We have also gained valuable information about computers in the English classroom from Bob Walder, who recently attended sessions on this topic at the League for Innovation Conference in Orlando. He has been particularly helpful in furthering our understanding of networking.

The English faculty has also read several articles and books on computer use in the English classroom. According to the literature, some of the benefits of word processing are:

1) Word processing, by its very nature, emphasizes that composing is a process. Frequently students see the production of an essay as the writing of a single draft. The advent of computers has helped students understand the transitory nature of a text as they modify it on the screen. The text literally becomes dynamic as they watch it grow on the monitor in front of them.

2) Word processing, also by its nature, encourages revision. Research shows that students do not "own" the text in the same way when it is on a computer screen; hence, they are not so unwilling to alter their own words. Students at Cumberland County College in New Jersey supported this notion in their comments in the August 1992 issue of the T.H.E. Journal. One student wrote: "'I find that with the computer, it is easier to revise and do all the time-consuming things, which leaves time for creativity. I don't have much patience. The computer makes it so easy to change everything, which makes me better, because, if I had to write it all out, I wouldn't go the extra mile.'" Another student wrote that the computer "'has helped me to become a better writer. Its major advantage has got to be proofreading and revisions. It is a terrific tool for turning out nice, clean papers. It has also helped in getting my ideas down on paper, or in this instance, disk. I can sit there and start typing real fast, just throwing out my ideas, then print them, then start writing a more structured paper.'"

3) Students who use word processors have a more positive attitude towards the act of writing itself.

4) Word processors with software dedicated to skill development in grammar, sentence structure, etc., would be an asset for disadvantaged students.

The faculty recommends that we network this lab with Ethernet technology. Some of the benefits of networking are:

1) Students will be better prepared for the kind of collaborative writing that they will encounter in the world of work. As Patricia Dorazio, Director of Technical Communication at SUNY, writes in the April 1992 issue of the T.H.E. Journal: "Writing is often thought of as a solitary event: inspired writers take their ideas to a room where, with pen and paper, they immortalize their words. But that scenario is no longer true in today's modern society as the writing process has evolved into a collaborative, highly electronic one." Dorazio writes further that "a good deal of professional writing is performed by a team of writers. This peer writing team is not only the group of writers who work together to produce a document, but who also review and critique each other's work. The goal of the team is to produce a document or a family of related documents that gives the appearance of single authorship and unity." (Acknowledging this trend in professional writing, Jody Grosh asked her Technical Report Writing students during the fall to prepare several of their reports collaboratively, with each student producing a section of a report that was collectively edited. Typically, Jody divides the class into groups of 4-6 students. The groups write proposals to each other and negotiate settlements as in the business world. Currently students must hand carry each correspondence across the room to another group. She feels the ability to share information more rapidly, by allowing groups to fire responses back and forth electronically, will hone both their skills in negotiation and critical thinking.)

2) Students who work in groups on a collaborative basis also learn better skills in human relations. Dorazio reports that in small group writing situations "students learn creative ways to handle conflict and dissonance. In other words, they learn tact and diplomacy."

3) In a networked lab students clearly gain a more realistic sense of audience; they can no longer write exclusively for the teacher.

4) The classroom itself becomes more student-centered rather than teacher-centered. Students become more self-directed and more independent in their thinking. (The proposed layout of the lab, illustrated in Appendix A, emphasizes groups of students working together rather than being dependent on the teacher who lectures from the front of the room.)

5) Faculty at Lehigh University report that a networked classroom encourages more class participation. Susan Haytmanek, the coordinator for the computer-equipped classroom, writes that "students who before may have been reticent to speak up in class now find the computer to be a liberating means of expression. As a result, the entire class now engages in dialogues impossible in more traditional settings."

6) Other research suggests that a networked classroom enhances the acceptance of a diversity of ideas, in that computers are colorblind and possess no sex bias.

7) A faculty member at Brandeis University, Alan Girelli, reports that computers actually save class time. Because students all see the text simultaneously over the network, Girelli "is able to eliminate 'cuing time' (constantly telling students what page or paragraph they are working on)."

8) Networking will also allow several computers to share a single printer.

Computer Use in English Curriculum

The faculty has spent considerable time debating how computers should be used in our English classes and determined that we would begin by offering a few classes each quarter in the lab. (At this time we could not offer all English classes in computer labs even if we wanted to due to a lack of computer stations; in the fall we offer over twenty sections of English I alone.) We would like to list these classes in the schedule as being offered in a computer lab so that students could choose whether they wish to take computer-based classes or not. All full-time faculty, with the possible exception of Judith Anderson, would like to teach a section in the lab in the fall of 1993 on a pilot basis. (Brian would like to try a section in an IBM lab during the summer.) The group felt that if we begin on a "pilot" basis that we will be able to determine the strengths

and weaknesses of teaching English in a computer-intensive environment. All full-time faculty realize that they will need to spend the first week or so discussing the process of writing and acclimating students to the role that computers play in that process. (We may ask that each student purchase an Introduction to WordPerfect manual to facilitate their overall learning process. Bob has also volunteered to conduct "mini" sessions on computer use for any faculty member who requests this service.)

Most faculty will begin by teaching English I (rather than English II) in the lab. Chris, in particular, would like to use a networked environment for more advanced classes in English, Intermediate Composition and Creative Writing, courses traditionally offered in the winter and spring terms. The faculty felt strongly that Technical Report Writing, which is already offered almost exclusively in one of the Rhodes Hall Computer labs, should continue to be offered in a computer-intensive environment, especially since students could use computers to help produce the graphics essential in so many technical reports.

To help faculty become familiar with Macintosh hardware and software, we have recently made four Mac's available for English faculty use. Wordperfect is also on order so that they can become acquainted with the word processing package we will probably be using in the lab (or if they determine that they do not like Wordperfect, we should know well in advance of actually ordering any package for the lab).

Specifically the faculty want to use networking to be able to:

1) Bring a disk into the lab and call up the same text to all of the computers for the entire class to see and to work on as a large group;

2) Bring a disk into the lab and ask students to make a separate file of their own for this particular text. Students could then work on the same text in small groups or individually.

3) Ask students to respond to a question (e.g., What would be a good thesis sentence for this essay?) on their computers and then combine their responses into one file to share with the entire class electronically or through hard copy.

4) Share journal entries. (This would be a particularly good strategy in a

literature class as a springboard for discussion.).

At this point we have not included a request for a file server, believing that our needs in English can be met through Ethernet technology and with 230 meg HD's in each machine. (Bob estimates that with the current software we are hoping to order that each machine will need 100 meg for starters.) We have also not requested a video wall projection unit due to the great expense ($25,000 per unit); however, we have included a request for a color LCD panel ($3000) for an overhead projector, which would allow us to direct students' attention to material appearing on one central location on a wall. Faculty have reported that it is difficult sometimes to gain students' full attention if they are looking at their own screen or if they are pressing their own keys. Students could then model what they see on the wall.

Plan for Mac Lab

We would propose that R230 be converted to a Mac Lab during Summer A of 1993. Paul has informed me that he needs to have this project, if funded, completed by July 1 in light of activities that he will need to facilitate for the Performing Arts Center. Our goal would be to schedule our first classes in the lab for the fall of 1993.

Computers for Mac Lab

We are requesting a total of 30 machines: 28 for student use, 1 in the lab for instructor use, and 1 for the commercial art faculty in R 320 (faculty offices) for grading in private and for exploration of software. We feel that it is essential for all students to have their own work station. While students may be comfortable working with each other at the same station initially, they will rapidly need to work independently; this is especially important for art students who need time to "create" their projects and for composition students who need time to develop their essays.

The specific request for the machines is included in Appendix B. Jim Hebner did most of the groundwork for this portion of our plan, with considerable assistance from Bob Walder. We have selected a system that will allow for maximum speed (8 meg RAM) and maximum space (230 meg

hard drives). The CD ROM Drive for each machine is necessary for the storage of clip art and fonts. (Without these we would need to load the fonts, etc. on the hard disk.) We have debated screen size and concluded that a 14 inch screen would best meet the needs of both the programs in English and Commercial Art.

Other Equipment for Mac Lab

As the illustration in Appendix A shows, we would like to order a total of 6 printers, all with specific functions. The two HP LaserJet 4M printers will be all-purpose printers to be used for classes in English, Spanish, and Commercial Art. Each printer will be hooked up to 8 computers. The 2 large format printers will have a dual function; they, too, will each be hooked up to 8 machines for general printing; however, these machines will also perform a valuable function for the art students, in that there are 3 different paper tray sizes. Much of the art that is produced by students is larger than the traditional 8 by 11 page size. The 2 color printers will be used exclusively by the art students; it is critical that the resolution on these printers be 300 dots per inch, in that the color in the art that is produced needs to be identical to what the student actually sees on the screen. We expect to control these printers through a locking mechanism so that they will not be operable during open lab. As the illustration shows, they are located at the back of the room to discourage casual use.

We have included a request for Syquest drives because they allow the storage of large files on removable cartridges. The common 3 and one-half inch high density disk stores between 1.40 and 1.44 megabytes. The Syquest cartridges have a storage capacity of either 44 or 88 megabytes. Layout II and III will have an emphasis of working in color. Scanned images of photographs and artwork in color have the potential of creating large files. (In the current computer lab we can scan images only in black and white. A relatively small photograph scanned in black & white fills an entire 3 and one-half inch high density disk.) We will also be using Adobe Photo Shop in Layout II and III to modify or combine scanned images and place them within the context of a designed page layout. Photo Shop is known to create large files. Each of the local design studios that Eunice and Richard visited use the Syquest drives. In their discussions with them and with others, it was mentioned that we would need a storage device

such as the Syquest drive with removable cartridges. It was also suggested that the storage device we choose be an industry standard; Syquest drives are an industry standard. At this point we would expect to add an additional lab fee to Layout II (estimate of $75) so that we can purchase a cartridge for each student. Students will then be able to carry that cartridge with them to a job interview or have additional copies printed at a service bureau. With compatible equipment a potential employer may wish to directly view the student's work on screen rather than a printed version, which may not depict the true colors found in the finished design/layout.

We have included 2 color flatbed scanners that will be located on the same table as the color printers. These are critically important pieces of equipment because they allow students to combine handwork with computer work. Students will be able to scan images into the computer for desktop publishing and other art work.

Software for Mac Lab

We would like to load all 30 machines with the same software. Some of the advantages of this arrangement are listed below.

1) If one or two machines is down, we would still have enough computers to provide access for students.

2) More students could be scheduled for a class if absolutely necessary (e.g. Computer Art is only offered once a year; while we expect to limit the overall enrollment to 20 students, we might admit an extra student or two to avoid creating an additional section).

3) We would be able to avoid competition among students for certain machines (which is one of the disadvantages of loading only certain software on certain machines).

4) We could serve more students in open lab.

5) Students not in a particular class could work independently while another class is in process. (This, in fact, occurs regularly now. Art students, for example, work in the lab on their separate projects while

Technical Writing is actually in process.)

Software for Commercial Art

Bob Walder and Richard Wagner have done a fairly extensive search for software (and the best prices) for the art program. As Appendix B shows, we are concentrating on two "families" of software that should allow for easy integration of one software package with another. Aldus and Adobe packages are standards in the field and will be of great assistance for students trying to enter the job market. In fact, without some exposure to these packages in the future, students may not be able to readily find employment. As mentioned earlier in the section on curriculum, Aldus Pagemaker, used for setting type and creating page layout, is the standard in the field. Aldus Freehand is used to design on the screen and seems to be preferred over Adobe Illustrator. Our research suggests that Illustrator is harder to use and less forgiving, but many agencies use it as a powerful tool for design. We would not expect proficiency with Illustrator, but we would expect to expose students to this software so that they know its general function. A basic knowledge of this program, and Freehand as well, will assist students in learning other programs on the job more easily. Adobe Photoshop would be used in Layout to combine existing images and to further develop images--it is very powerful and would allow students to retouch, change, and alter images. It is considered on the cutting edge for fine arts design.

Software for English

As mentioned earlier, we are considering the adoption of Wordperfect as our standard. However, we are also experimenting with other software. Bob Walder has sent for a demo disk for Writer's Prologue, which apparently will allow students to:

1) work independently or in groups (including E Mail and conferencing);

2) begin with a simple word processing module that will allow Word Perfect to be imported (If this module were used, the faculty might have to spend less time actually teaching computer use.);

3) see a top and bottom section on the screen. The top shows the

conversation that is going on with the class as a whole, while the bottom allows the student to compose in private and then dump his/her material on to the top screen on command.

Open Lab Time & Assistance in the Lab

One of the major concerns for all the faculty is that there be open lab time and assistance during the hours when faculty are not in the lab. Bob recommends that we ask for student work study for approximately 30 hours per week to cover all the labs. He expects to load the labs with classes for 60% of the time and to have them open for general student use for 40% of the time. The work study help would be available during open lab. The labs are currently open from 8:00 A.M.-10:30 P.M., Monday-Thursday, and 8:00 A.M.-5:00 P.M. on Friday. We may want to consider opening at least one of the labs on Saturdays so that students can complete papers, projects, etc. during their free time.

Upgrading Hardware and Software

We currently charge lab fees for the art courses that occur in the R 222 lab and have designated that that funding be used for supplies (paper, ribbons, etc.). Next year, for the first time, we have added a lab fee of $3 for all students in Technical Report Writing. This fee should be added to Bob's budget for lab supplies. One of our greatest concerns, and one that will not be addressed directly in this proposal, is that we will need to build in funding in years to come for software; Bob estimates that we will need to update software almost every two years. As you may know, engineering students at OSU will pay a fee of $120 beginning Spring Quarter, 1993, for updating software and hardware. This issue may be one of interest to the larger task force investigating computers on our campus.

Faculty Development

Although this proposal also does not directly deal with the issue of faculty development, the faculty in our division feel that training (and continued training) on a systematic basis should be made available to them if they are to make the best use of our resources. I would recommend that we send our English/Technical Writing instructor to a training workshop of some sort, preferably before summer term begins. (I

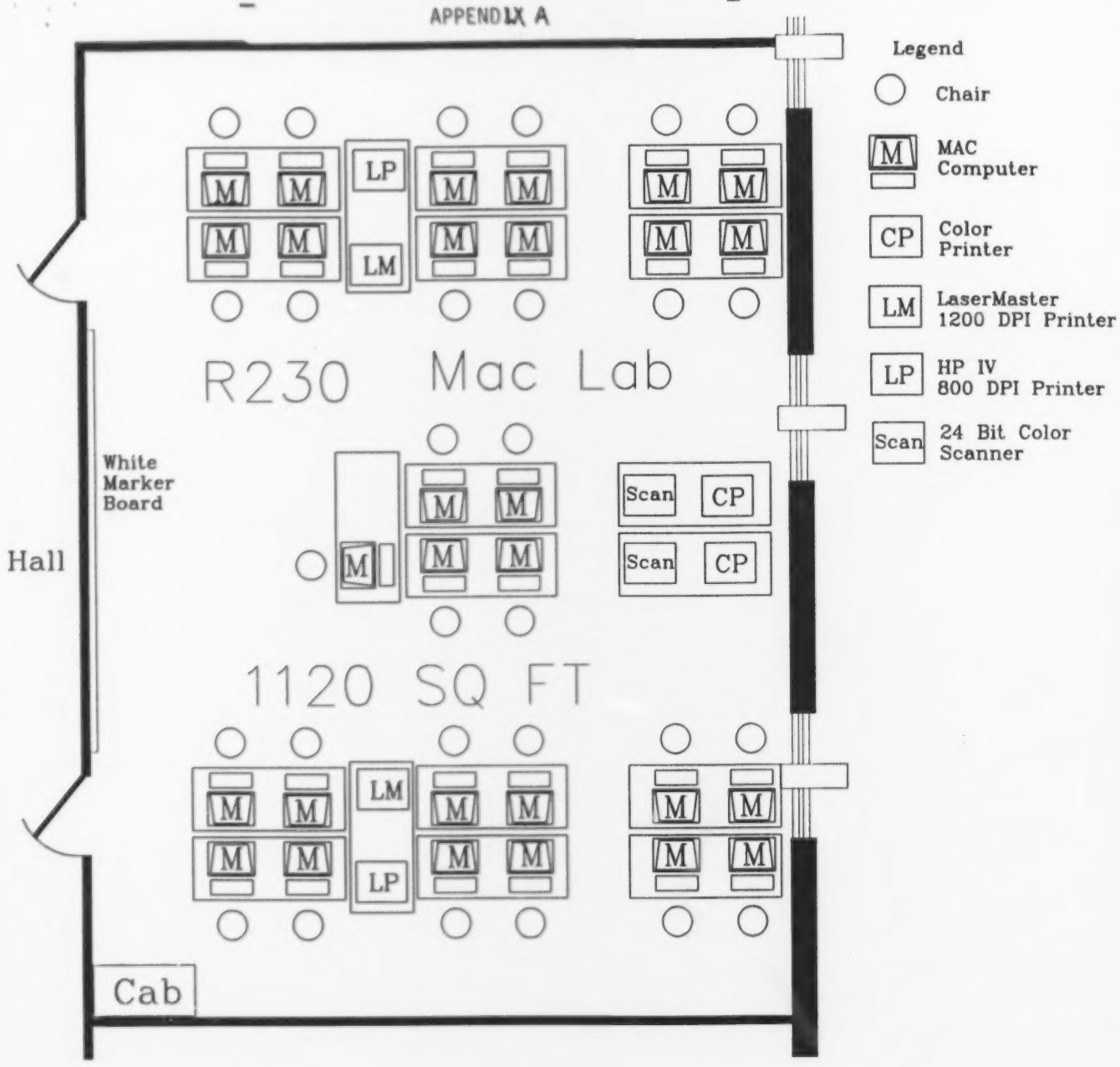
believe that the two-week seminar at Michigan Technological Institute that Julia attended is offered every year and would probably be well worth the expense.) At the very least, we should probably plan some "development" time in the summer (or during the week before classes begin in the fall) for the English faculty to explore the software in the lab. (They could probably act as a "class of students" as they find uses for the net working.)

Conclusions

We appreciate your consideration and support for this proposal. In technological terms, this lab should help us become "state of the art" in two curricular areas.

Finally, I am certain that you feel the same level of appreciation for the extraordinary effort that faculty and staff have put into the preparation of this document. They are to be congratulated for their fine work and their willingness to work together to resolve issues.

APPENDIX A


Legend
Chair
MAC Computer
Color Printer
LaserMaster 1200 DPI Printer
HP IV 800 DPI Printer
24 Bit Color Scanner
LP
LM
CP
Scan
R230 Mac Lab
White Marker Board
Hall
1120 SQ FT
Cab

To: Marsha Bordner

From: Robert Walder

Date: January 6, 1993

Subject: Equipment and Software for R230 Mac Lab

In order to meet the current and future needs of programs in the Arts and Sciences Division the following equipment and software is required to equip Rhodes Hall Room 230 as a Macintosh computer laboratory. The lab has been designed to support instruction in English, Spanish, Desktop publishing, and Computer Art. Large hard drives were selected to provide sufficient program storage space for the large variety of software required to support the very diverse courses. In addition Syquest drives were selected to support the Commercial Art students, who develop very large files while completing their assignments. Due to the rapid changes in technology it was decided to provide CD Rom drives to enable the Commercial Art program to take advantage of the large number of fonts and programs now available on CD Rom disk. An Ethernet network was selected in order to overcome the speed problems in an Appletalk network. A 10-Base-T system was selected to provide for future expansion and development.

Computers

Jim Hebner has proposed the Macintosh IIvx with 8 meg RAM, 230 meg HD, CD ROM Drive, 14 inch screen, and extended keyboard as best meeting current and future needs of the college. We are recommending 28 student computers, one classroom instructor computer and one computer for faculty area for grading and software testing

each $3950 x 30 = $118,500

Removable Hard Drives for Commercial Art

Syquest Drive 44 meg..... $440 x 30 = $13,200
44 meg removable cartridge .... $62.97 each

Mac'sPlace
8461 154th Avenue NE
Redmond, WA 98052
1-800-367-4222

Alternate vendor
Syquest Drive 44 meg..... $304 x 30 = $9120
44 meg removable cartridge .... $67.00 each

BellMicro Products
1941 Ringwood Avenue
San Hosea, CA 95131
1-800-697-2355

Maintenance for machines

The Mac computers come with a one year warranty that requires CSCC to transport the machine to the Centerville dealer for service.

A first year service contract would provide a 2 hour response by telephone and a within 8 hour response for on site service.
First year only is $75 per computer x 30 = $2250

A service contract to provide the same coverage for the second and subsequent years $325 per computer per year.
$375 x 30 = $9750

I believe that we would be ahead to transport units requiring warranty service to the dealer for service and then to take care of maintenance ourselves in future years. Currently CSCC does not have service contracts for the IBMs and compatibles after the warranty expires.

Hardware and Software for Network

The network equipment may be purchased from;
Focus Enhancements, Inc.
800 West Cummings Park
Wobum, MA. 01801
617-938-8088 or 800-538-8866

Computer Ethernet card EtherLAN A1-II #60-3600
$139 each x 30 = $4170

Ethernet Hub LCT/FPU 10-Base-T #60-4300
$250 each x 4 = $1000

Cables and connectors ..... estimate $3000

Network software may be purchased from:
MacWarehouse
PO Box 3013
1690 Oak Street
Lakewood, NJ 08701-3013

GraceLAN Network Manager 2.0, 50 user package $279

Software for English and Spanish

The English and Spanish faculty are in agreement in selecting WordPerfect word processing software for use in the courses that they teach.

WordPerfect English version
Educational licence for 8 machines $160 x 4 = $640

WordPerfect Spanish version
Educational licence for 8 machines $160 x 4 = $640

The Daedalus Integrated Writing Environment
Site license $299

ClassWriter Academic Version
Site license $299

Software for Commercial Art

The following prices are the best available at the present time for the software packages have been recommended for the commercial art program. The Aldus software packages may be purchased at the educational price for lab packs from Aldus or one of their dealers. The Adobe packages may be purchased from Douglas Stewart Co. one of CSCC's current vendors. We may get a further discount through the bookstore.

	Pkg Price	For 30 Computers
Aldus Pagemaker - 5 User Lab Pack ..	$450	$2700
Aldus Freehand - 5 User Lab Pack ...	$375	$2250
Adobe Illustrator - 10 User Lab Pack..	$595	$1785
Adobe PhotoShop 2.01 10 User	$895	$2685
Com. Art Software total for 30 computers ---------		$9420

Printers

General printing for English, Spanish, Technical Report Writing, and Commercial Art.
Hewlett-Packard LaserJet 4M with integrated Postscript Level 2, 6MB memory
HP #C2021A ..... each $1740 x 2 = $3480

Large format printer LaserMaster 1200XL printer plain paper with 8.5 x 11, 8.5 x 14 and 11 x 17 paper trays. The printer comes with networking connections and only requires cables. It will connect to IBM compatibles or Macs. The LaserMaster printer fonts may be loaded on all computers.

LaserMaster 1200XL ... each $8845 x 2= $17690

Items for Commercial Art only:

Color scanner to scan images into computer for use in Desktop publishing and artwork.
Epson #800C 24 bit color scanners - each $1499 x 2= $2998

Color printer
Hewlett-Packard color printer with Postscript Level 2.
Hewlett-Packard 300XL ..... each $3400 x2= $6800

Room Modifications

Bud Wells of Business Equipment provided a phone quote for tables and chairs similar to R229

Six foot x 30 inch computer tables with Oak tops
$180.50 ea. x 30 = $3429.50

Adjustable computer chairs $70.38 ea. x 30 = $2041.02

Power poles and wiring estimate $1500.00

White board to eliminate chalk dust from computer drives
$600 each.....$600.00

Carpet for Lab .....$15 x 132 sq yd = $1980

Security

Due to the rising crime rate in Springfield and an increase in campus crime, it is time to consider methods to deter computer theft. I have discussed the problem with Mr. Andrew Stallard of Anderson Security and Fire Systems Inc. and his recommendation is to install pull-apart alarm cords on the monitors, CPUs, printers, and scanners. The units would be tied to a control panel located in the room. The panel is similar to the current building security system. If an attempt was made to remove a component from the room a siren would sound as well as trigger the building alarm system. The alarm system would provide for increased computer security and still allow quick repairs to equipment. A technician would enter his identification code and remove a computer for repair without going through a complicated series of steps to remove a passive restraint system.

Security system with alarms and control panel installed
$4000

Total cost of equipment and software $206,356